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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

MCLEAN-MAYO, KIMBERLY N

ART UNIT PAPER NUMBER

2187

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--|---|--|
| Office Action Summary | Application No. 09/855,483 | Applicant(s) TOMASZEWSKI ET AL. | |
| | Examiner Kimberly N. McLean-Mayo | Art Unit 2187 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7,10-12,14-16 and 18-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,10-12,14-16 and 18-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The enclosed detailed action is in response to the Amendment submitted on January 3, 2003.

Claim Objections

2. Claims 12 and 27 are objected to because of the following informalities:

Claims 10 and 18, lines 3 and 2-3 respectively state "a number "n" storage areas". This should state, " number "n" of storage areas".

Claim 12, line 3 states, "the spin axis". This should state a "spin axis".

Claim 19, line 4-5 state "the commands". This should state, "the disk access request".

Claim 25, lines 5-6 state, "the least latency". This should state, "a least latency".

Claim 27, lines 4 and 7 state, "the command controller". This should state, "the command processor".

Claim 30 line 1 states, "of claim 29". This should state, "of claim 28".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 4-6, 10-12, 14-16, 18-20 and 23-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Paterson et al. (USPN: 6,412,042).

Regarding claim 1, Paterson discloses a plurality of concentric tracks defined on a disk (C 6, L 56-58); at least two data storage areas (Figure 7B, References 76,78), wherein each area is sized to store a copy of a set of data and the data storage areas are substantially equidistantly spaced from each other (C 7, L 17-19, L 39-44; Figure 7B illustrates the data storage areas substantially equidistantly spaced from each other) and wherein all of the at least two data storage areas are located within plus or minus one track of the same track (Figure 7B illustrates the data storage areas within tracks which are adjacent each other).

Regarding claim 2, Paterson discloses the at least two data storage areas are located at radially opposed locations at a substantially 180 degree angular offset with respect to a spin axis (spin axis of the spindle) of the rotating data storage disk and mirrored across the spin axis (Figure 7B illustrates the data storage areas located at radially opposed locations, [with respect to the spindle which is located at the center of the disk, refer to Figure 3], at a substantially 180 degree angular offset, wherein the data storage areas are mirrored across the spin axis [the data storage areas are mirrored across the spindle and thus are mirrored across the spin axis]).

Regarding claim 4, Paterson discloses the disk comprising at least two magnetic recording surfaces (Figure 3, Reference 23 corresponding to each Reference 22), wherein the data storage areas are formed in one of the at least two magnetic recording surfaces (C 7, L 46-48, L 50-52).

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Regarding claim 5, Paterson discloses the disk further comprising at least two magnetic recording surfaces (Figure 3, Reference 23 corresponding to each Reference 22), wherein the data storage areas are formed in separate ones of the at least two magnetic recording surfaces (Figure 7C, C 7, L 46-48, L 53-57, L 61-66).

Regarding claim 6, Paterson discloses the disk further comprising an optical recording surface (C 20, L 50-52; CD-ROMS are optical drives with optical recording surfaces).

Regarding claim 10, Paterson discloses the at least two data storage areas comprising a number “n” of storage areas and the disk exhibiting a characteristic virtual revolutions per minute (RPM) that is a multiple n of the actual spin speed of the rotating data storage disk (Figure 7B illustrates the at least two data storage areas comprising two storage areas [References 76, 78] and accordingly, since the data storage areas are mirrored at adjacent locations 180 degrees from each other, the read latency is reduced 50 % and the virtual spin speed is 2x the actual spin speed).

Regarding claim 11, Paterson discloses one or more platters, each platter supporting at least one recording surface, wherein the platters are aligned about a common central axis (axis of the spindle) (C 7, 59-60; C 6, L 36-42; Figure 3, References 22); a plurality of concentric tracks defined on the disk (C 6, L 56-58); means for spinning the platters about the common central axis (Figure 3, Reference 12; C 5, L 59-61); a recording head associated with each recording surface (Figure 3, Reference 28; C 5, L 61-62; C 6, L 39); an actuator mechanism coupled to

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each recording head (via Reference 26) to move the recording head into proximity with selected portions of the recording surface in response to received commands (Figure 3, Reference 14; C 6, L 20-30); and at least two replicates of data stored in at least two data storage areas (Figure 7B, References 76, 78) such that any one of the at least two replicates can be accessed to service a data access request (C 11, 36-52) and all of the at least two data storage areas are located within plus or minus one track of the same track (Figure 7B illustrates References 76 and 78 as adjacent to one another).

Regarding claim 12, Paterson discloses the data storage areas are located so as to be mirrored about the spin axis of the platters (Figure 7B illustrates References 76 and 78 mirrored about the spin axis of the platters).

Regarding claim 14, Paterson discloses the data storage areas formed in a single one of the one or more platters (Figure 7B; C 7, L 46-48, L 50-52).

Regarding claim 15, Paterson discloses the data storage areas formed in separate platters of the one or more platters (Figure 7C, C 7, L 46-48, L 53-57, L 61-66).

Regarding claim 16, Paterson discloses each recording surface comprising a plurality of concentric tracks defined on the recording surface and each track is substantially aligned with a corresponding track on an adjacent platter (Figure 3 illustrates the platters centered about the spindle thereby substantially aligning the platters and the tracks of the platters), wherein all of

the at least two data storage areas are located on adjacent tracks (Figure 7B illustrates the at least two data storage areas, References 76 and 78, on adjacent tracks).

Claim 18 is rejected for the same rationale applied to claim 10 above.

Regarding claim 19, Paterson discloses a command processor having an interface to receive external disk access requests and coupled to provide the commands to the actuator mechanism (Figure 8, Reference 82; the processor receives disk access requests from Reference 60 and the processor provides commands to actuator, Reference 54); and memory coupled to the command processor (Figure 8, Reference 80; C 8, L 7-11) and configured to store redundant write access request commands such that the at least two replicates can be stored asynchronously (C 11, L 64-66; C 12, L 8-14; Figure 12, Reference 142 and 148 – the data corresponding to the write request is duplicated in the memory, wherein the write data and the duplicated write data are effectively executed as a write command and a duplicated (redundant) write command when the write data and the duplicated write data are removed from the memory and thus the write data and the duplicate (redundant) write data stored in the memory represent the write command and the redundant write command respectively).

Regarding claim 20, Paterson discloses receiving an access request (Figure 12, Reference 140; C 11, L 62-64); replicating the access request (C 11, L 64-66; C 12, L 8-14; Figure 12, Reference 142 and 148 - when the write data is duplicated, the write request is duplicated since the write data is executed as a write command and therefore also represents the write command), wherein

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the replicated access request refers to a track adjacent to a track referred to by the access request (when the disk is setup as shown in Figure 7B, the replicated access request refer to a track adjacent to a track referred to by the request since both data storage areas are adjacent one another) and executing at least one of the access request and the replicated access request to a disk media within the data storage mechanism (C 12, L 5-10).

Regarding claim 23, Paterson discloses each access request specifying a logical location of a set of data to be accessed (C 7, L 12-31 – each request includes an identifier which specifies a set of data using the lookup table) and the act of replicating comprises determining at least two physical locations corresponding to the logical location of the set of data (C 11, 67; C 12, L 1-4; C 7, L 26-31).

Regarding claim 24, Paterson discloses the data storage mechanism comprising one or more disk media (Figure 3, References 22) and the act of determining at least two physical locations further comprises determining the at least two physical locations that are located at radially opposed locations on the disk media (C 11, 67; C 12, L 1-4; C 7, L 26-31 – when the two physical locations are located as shown in Figure 7B, the locations are located at radially opposed locations on the disk media).

Regarding claim 25, Paterson discloses the access request comprising a request to read data and selecting either the access request or the replicated access request based upon which provides the least latency and executing the selected request (C 12, L 65-67; C 13, L 1-17).

Regarding claim 26, Paterson discloses a request to write data (C 11, L 62-64) and selecting one of the access request and the replicated access request (C 12, L 33-46); executing the selected access request (C 12, L 5-8); and buffering the unselected request (C 12, L 8-10); and executing the buffered request asynchronously with respect to the selected request (C 12, L 10-14).

Regarding claim 27, Paterson discloses a command port for receiving access request (signal line coupled between References 56 and 60 in Figure 4; C 6, L 50-55); a command processor for executing software processes (instructions stored in ROM, Reference 84, in Figure 8)(Figure 8, Reference 82; C 8, L 11-17); a first process executing in the command controller for replicating a received disk access request, wherein the first process generates a replicated access request that refers to a track adjacent to a track referred to by the access request (instructions stored in ROM, [Reference 84, Figure 8], which perform the features described in C 11, L 39-41, C 11, L 67; C 12, L 1-5, L 8-10; Figure 12, Reference 148 for a disk which is setup as shown in Figure 7B, wherein the two data storage areas are located adjacently, References 76 and 78 are located in adjacent tracks); a second process executing in the command processor for executing at least one of the received disk access request and replicated disk access request against a disk drive (instructions in ROM (84) which perform the features described in Figure 12, References 146 and 150; C 12, L 5-8, L 10-14).

Regarding claims 28-29, Paterson discloses the first process comprises causing the processor to determine radially opposed locations within the disk and to determine adjacent tracks within the

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disk suitable for the disk access request (C 11, L 67; C 12, L 1-5; referring to Figure 7B, the data locations within the disk are located at radially opposed locations and are located on adjacent tracks and thus when the processor determines locations [Figure 7B, References 76, 78] suitable for the disk access request from the lookup table, the processor intrinsically determines locations at radially opposed locations within the disks and locations located on adjacent tracks).

Regarding claim 30, Paterson discloses the second process receiving the determined radially opposed locations and executes the at least one disk access request at the determined location (C 12, L 5-8, L 10-14 – the second process writes data to the data locations and thus it is evident that the second process receives the locations).

Regarding claim 31, Paterson discloses a redundant data table (locations within Reference 80 in Figure 8 where the duplicated data is stored) holding one or more pending write access requests (C 12, L 8-10 - Reference 80 stores duplicated write data, the duplicated write data is executed as a write command when removed from the memory and therefore also represents the write command) and coupled to the second process (via Reference 82 in Figure 8) such that the second process can execute the received disk access request and the replicated disk access request asynchronously (C 12, L 5-8, L 10-14).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paterson et al. (USPN: 6,412,042) in view of Takahashi et al. (USPN: 5,707,727).

Paterson discloses the limitations cited above, however, Paterson does not explicitly disclose the disk further comprising a magneto-optical recording surface. Takahashi discloses the use of a magneto-optical recording surface (Abstract) as a recording method that provides a large capacity memory (C 2, L 35-38). Paterson teaches that the invention is applicable to other storage media (C 20, L 50-52) and hence it would have been obvious to one of ordinary skill in the art to use a magneto-optical disk drive in the system taught by Paterson for the desirable purpose of providing a large capacity memory.

7. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paterson et al. (USPN: 6,412,042).

Regarding claim 21, Paterson discloses the limitations cited above in claim 20, however, Paterson does not disclose receiving a request over a SCSI bus. However, SCSI interfaces are well known in the art for providing a high speed parallel interface. Hence, one of ordinary skill in the art would have been motivated to use a SCSI interface in Paterson's system wherein a request is received over a SCSI bus for the desirable purpose of providing a high speed parallel interface thereby improving the performance of the system.

Regarding claim 22, Paterson discloses the limitation cited above in claim 20, however, Paterson does not explicitly disclose receiving an access request over an IDE bus. IDE interfaces are well known in the art for their reduced cost (compared to SCSI) and for their simplicity. Hence, it would have been obvious to use an IDE interface such that the access request is received over an IDE bus in Paterson's system for the desirable purpose of reduced cost and simplification.

Response to Arguments

8. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

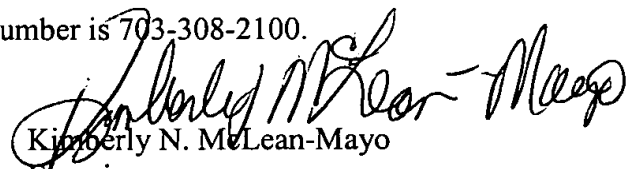
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly N. McLean-Mayo whose telephone number is 703-308-9592. The examiner can normally be reached on M-F (9:00 - 6:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Do Yoo can be reached on 703-308-4908. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7329 for regular communications and 703-746-7240 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2100.


Kimberly N. McLean-Mayo
Examiner
Art Unit 2187

KNM

March 7, 2003